Army Policy and ASHRAE 189.1

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US Army Corps of Engineers
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New Army Policy

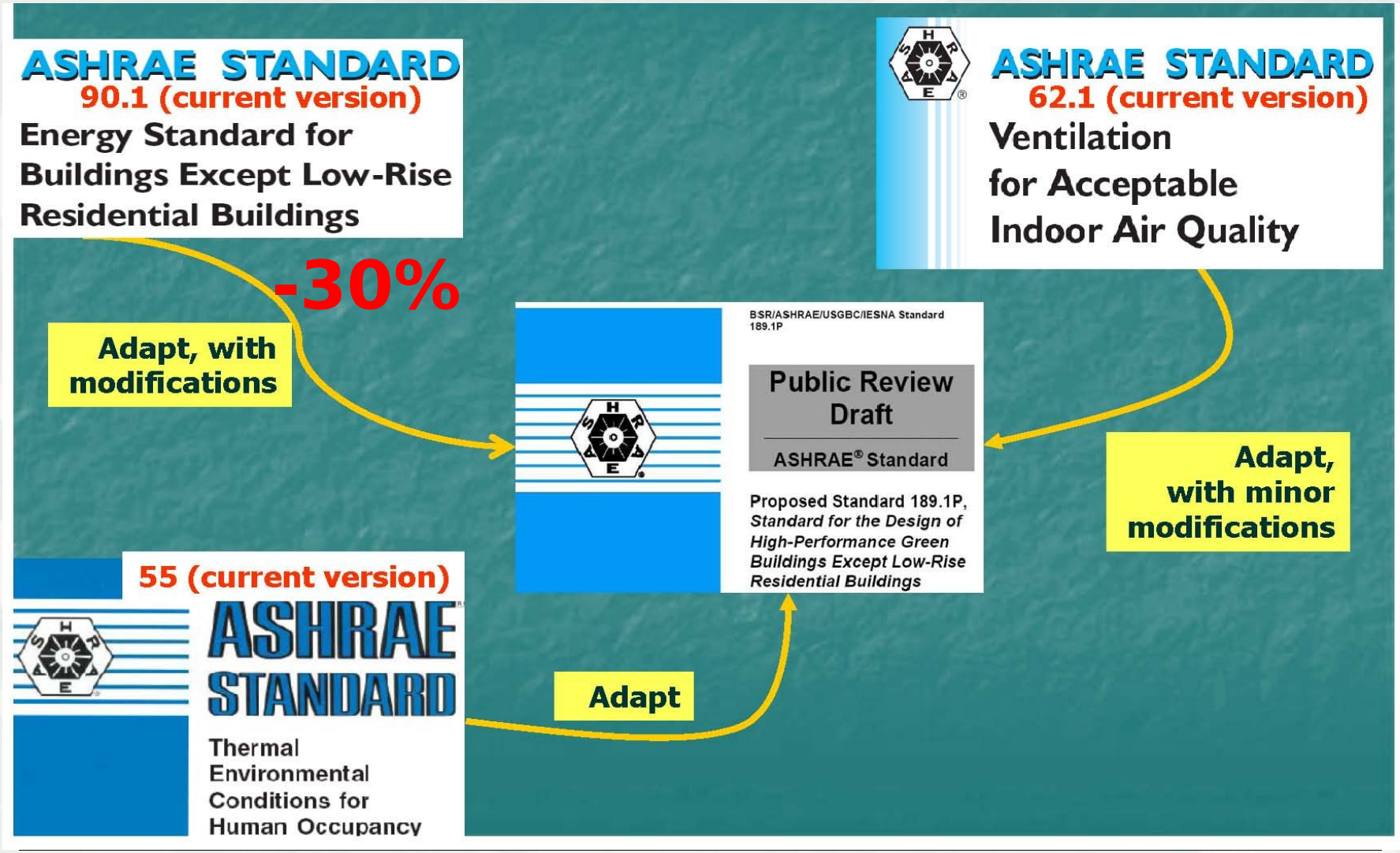
On October 27, 2010, Ms. Hammack, who was a member of the ASHREA 189.1 development committee, issued an update to the Sustainable Design and Development Policy that changes our MILCON energy performance standard from 40% better than ASHRAE 90.1 to ASHRAE 189.1.

Due to many differences between the private sector and the MILCON project requirements and site circumstances common to Military installations, the policy includes many important exceptions and caveats.

Honorable Katherine Hammack

Assistant Secretary of the Army
(Installations, Energy, & Environment)
Office of the Assistant Secretary of the Army

Standard 189.1 Relation to Other ASHRAE Standard



ASHRAE Standard 189.1 Scope

Provides minimum criteria that:

(a) Apply to new buildings and major renovation projects (new portions or new systems

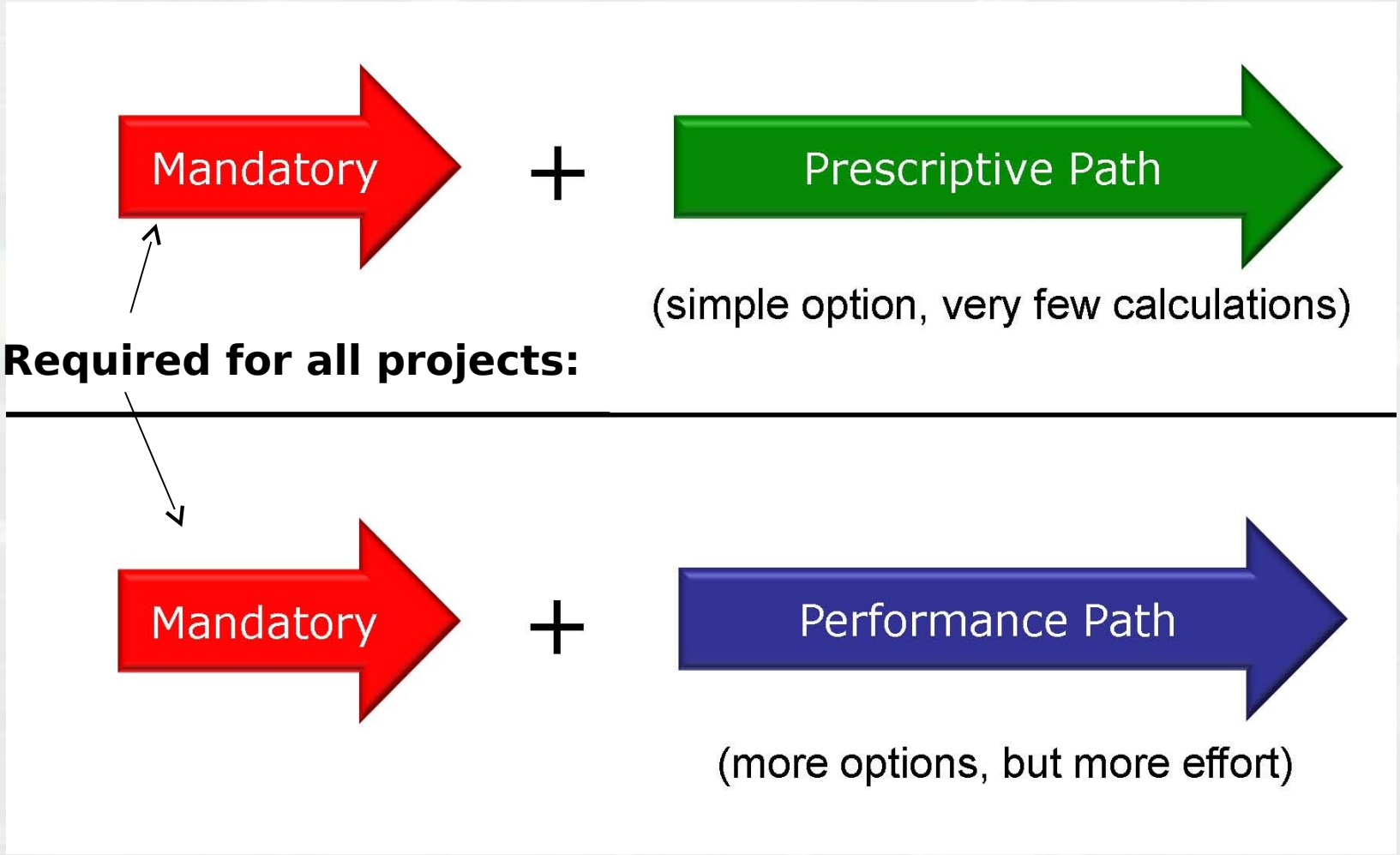
(b) Addresses site sustainability, water and energy efficiency, IEQ the building's impact on the atmosphere, materials and resources.

Does not apply to:

(a) Single-family residential, multi-family <3 stories, manufactured houses (mobile or modular homes)

(b) Buildings that do not use electricity, fossil fuel or water.

Compliance Paths



ASHRAE Standard 189.1 Topic Areas

SS	Site Sustainability
WE	Water Use Efficiency
EE	Energy Efficiency
IEQ	Indoor Environmental Quality
MR	Building's Impact on the Atmosphere, Materials and Resource
CO	Construction and Plans for Operation

ASHRAE Standard 189.1 - Site Sustainability

Site Selection:

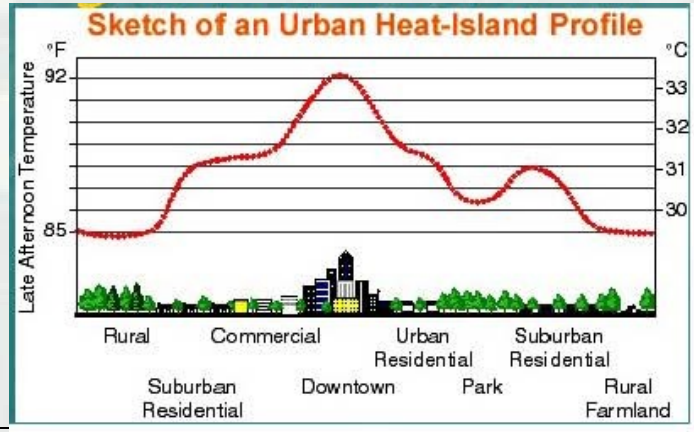
- Prohibits “sprawl” – **incompatible with many Army sites**
- “Allowable Sites – Brownfields, Greyfields, or Urban infill
- Prohibited development activity
  - Greenfields
  - Flood plains
  - Wetlands
  - Fish & Wildlife habitat

Reduce heat island effect:

- Shaded or higher solar reflective index (SRI) materials

Reduce light pollution:

- Max lumens per site
- Backlight and glare limits



Site Development Performance or Prescriptive Measures

SS WE EE IEQ MR CO

Mapping 189.1 to Army Requirements

Section 5 – Site Sustainability

	FY11/12	FY13
Site Selection – Sec. 5.3.1		
SDD Policy Update states that Project Planners and Master Plan development teams shall review and evaluate 189.1 Sec 5 "Mandatory Provisions" as part of all project site selection activities.	○	●
Preference will be given to project sites that meet the criteria for "Allowable Sites."	○	◐
Sites meeting the criteria for "Prohibited Development Activity" shall be avoided unless an exception is approved.	○	◐
Exceptions: Facilities typically sited in remote locations due to their function.		
Mitigation of Heat Island Effect – Sec. 5.3.2		
SDD Policy Update does not address compliance with 5.3.2.1 (Site Hardscape - vegetation, paving materials with SRI > 29, other buildings, etc) and 5.3.2.2 (Shading of Walls with vegetation, existing buildings, etc).	○	○
Full compliance with 5.3.2.3 (Cool roofs)	◐	●
Reduction of Light Pollution – Sec. 5.3.5		
SDD Policy Update does not address compliance with 5.3.3 Redcution of Light Pollution.	○	○
Site Development – Sec. 5.4.1 (Prescriptive) or 5.5.1 (Performance)		
Army Low Impact Development (LID) Policy 29 July 2010	◐	●

○ As Project Scope Allows ◐ Requirement with Exceptions Allowed ● Requirement - No Exceptions

ASHRAE Standard 189.1 - Water Use Efficiency

Site water use

- bio-diverse plantings
- hydro-zoning
- smart irrigation controllers

Building water use

- Plumbing fixtures & fittings per US EPA WaterSense or ASME Standards (generally 40% lower than EPAct 1992)
- Appliances per US EPA EnergyStar, with water use factor for public access appliances
- HVAC Systems and Equipment – Once through cooling w/ potable water prohibited
- Roofs

Water Metering

- Lease space >50,000 ft2
- Other users >1000 gal/day

Plus Performance or Prescriptive Measures

SS | **WE** | EE | IEQ | MR | CO

ASHRAE Standard 189.1 - Energy Efficiency

Goal of 30% more energy efficient than Standard 90.1-2007 (Including “Process” Loads and Renewable Energy)

Renewable energy provisions

- Provisions for future installation with minimum rating of 13 Btu/ft2 (40 W/m2) x roof area in ft2 (m2)

Energy measurement/metering for verification

- Remote or automatic reading measuring devices
- Communicate to central recording system

Electric peak load reduction

Plus Performance or Prescriptive Meas

SS WE EE IEQ MR CO

SHRAE Standard 189.1 - Energy Efficiency (Con

Prescriptive Measures – When requirement provided it supersedes Standard 90.1. For all other criteria, the project shall comply with 90.1.

Renewable Energy

- Annual energy production equivalent of 6 Kbtu/ft2 of conditioned space
- Exception for areas with incident solar radiation less than 4 kWh/m2-day and a cumulative purchase of green power of 70 kWh/ft2 for a period not to exceed ten years.

Building Envelope

- Generally more stringent requirements than Standard 90.1
- Shall comply with requirements in Tables A-1 to A-8
- Covers roof insulation, vertical fenestrati vestibules, and continuous air barriers

Other Prescriptive Areas

Prescriptive Option (Building Envelope)

- Example comparisons:

Example:

Climate zone 3	Std 90.1	Std 189.1
Insulation above deck	R-20 ➔	R-25

R=4.4 SI

- More stringent SHGC

Example for <40% window area:
Climate zone 5
Std. 90.1: 0.40
Std. 189.1: 0.35 all orientations

SHRAE Standard 189.1 - Energy Efficiency (Cor

Prescriptive Option - Mechanical

Equipment Efficiency Compliance Options

U.S. EPAct Baseline

Use equipment with U.S. EPAct baseline efficiency levels, and:

- Renewable energy system producing annually 6 kBtu/ft^2 of conditioned floor space
- Peak load reduction of 10%

Higher Efficiency

Use higher efficiency of EnergySTAR requirements and Appendix C, and:

- Renewable energy system producing annually 4 kBtu/ft^2 of conditioned floor space
- Peak load reduction of 5%

ASHRAE Standard 189.1 – Indoor Environmental Quality

Indoor Air Quality

- Ventilation rates per ASHRAE Standard 62.1
- Outdoor air flow rate monitoring of minimum outside air
- MERV 8 filter (MERV 13 in PM2.5 non-attainment areas)
- No smoking inside building
- Source contaminant control

Day-lighting

Acoustical Control

- ASHRAE Standard 55

Plus Performance or Prescriptive Measures

ASHRAE Standard 189.1 – The Building's Impact on the Atmosphere, Materials, and Resources

- Construction waste management
- Reduced Impact Materials
- Wood Products
- Refrigerants
- Storage and collection of recyclables and discarded goods
- Plus Performance or Prescriptive Measures

SS | WE | EE | IEQ | MR | CO

ASHRAE Standard 189.1 – Construction and Plans for Operation

Acceptance Testing / Commissioning

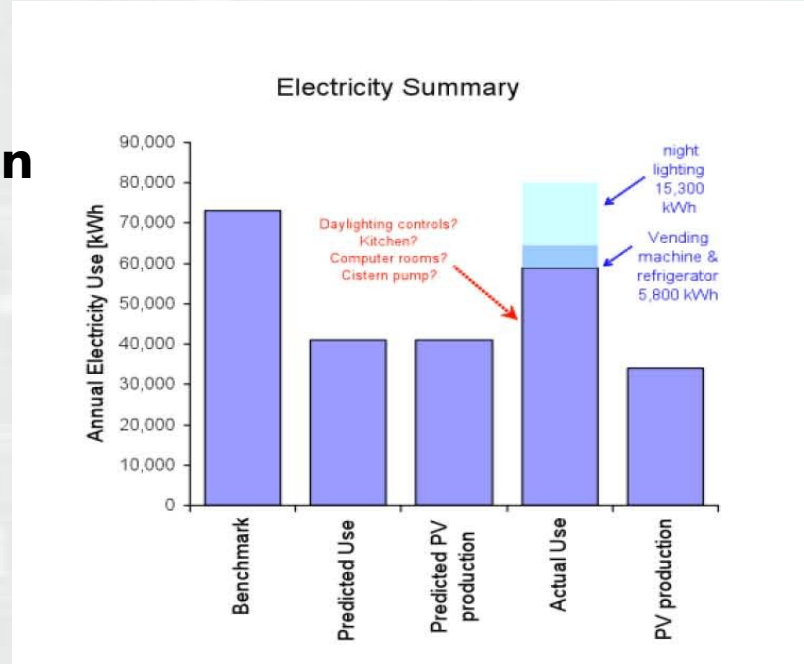
- For projects >5,000 ft2
- HVAC, building envelope, lighting, irrigation, plumbing, domestic water, renewable energy

IAQ Construction Management Plan

Plans for Operation

- High-performance building operation
- Maintenance
- Service Life
- Transportation Management

Plus Performance or Prescriptive Measures



SS WE EE IEQ MR CO

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Implementing Guidance

- A phased approach over a number of years
  - Learn as we go, do more with each opportunity
  - FY 11 (partial) and FY12 – 40 percent more efficient over ASHRAE Standard 90.1-2007
    - Adjusted FY12 project square footage (SF) by 1 -3 percent to account for thicker walls better insulated buildings. Programmed Amount (PA) held constant.
      - No changes made to FY11 program SF or PA
    - Life cycle cost analysis (LCCA) is required on single items or an aggregate of items that increase construction cost by 1 percent or more
      - Items that impact the annual maintenance or operation cost
      - Identified list of 21 Energy Efficiency Measures (EEMs) for a wide application of facilities and regions
- FY13 /14, partial compliance with ASHRAE Standard 189.1
  - Project SF were adjusted (1-3 percent) on the DD 1391
  - The 2 percent allotted for EPACT 2005 and LEED is retained for EISA 2007 compliance
  - Low impact design (LID) included in DD 1391 adjustment
  - Obtain full LEED silver certification

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Where to Find 189.1

USACE Staff (From a USACE Network):

- **Go to http://www.wbdg.org**
  - **Under "Participating Agencies, click DoD eal**
  - **In the picklist under the Corps logo, click Non-Government Standards.**
  - **Click on Select button under MADCADD**
  - **Proceed to eLibrary and search on 189.1**
    - **BE SURE TO CROSS REFERENCE EXCEPTIONS AND CAVEATS IN ASA(IE&E) SDD POLICY MEMO / ECB**